

PENSIONERS WHO DIE SOON AFTER RETIREMENT
CAN BE DISCRIMINATED FROM SURVIVORS BY
POST-RETIREMENT ACTIVITIES¹

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Summary.—Questionnaires were read to the wives of 26 living pensioners and to the widows of 20 age-matched contemporaries who had died within 5 years of retirement. The two groups of men were healthy at retirement and had worked for comparable durations in similar areas of a local mining industry. Only post-retirement measures discriminated the groups. Pensioners who died after retirement demonstrated more decreased interaction with friends, hobby time, and travel activity relative to survivors' activities. A discriminant function containing seven variables correctly classified 98% of the cases. Death occurred sooner for those pensioners who decreased their activity after retirement relative to those who demonstrated no change in activity. The data indicate that compensatory increase in activity after retirement may attenuate the risk factors associated with this sudden shift in a major reinforcement schedule.

Step-like changes in reinforcement schedules that have occupied a significant portion of behavioral time have been demonstrated to have extreme organismic consequences (4). Stated in less operant language, we could say that sudden and protracted changes in life-styles are followed by increased susceptibility to disease and a greater likelihood of death (1, 2, 3). Retirement from a job that has occupied approximately 30% of a human being's behavioral time for 30 to 50 yr. is a major schedule shift. The following study was designed to determine whether or not pre- and post-retirement activity measures could accurately discriminate those pensioners who died within the first five years from those who survived.

From a total of 115 possible cases (68 living and 47 deceased) who had retired between the ages of 52 and 62 years of age from a major mining industry, 26 living and 20 deceased (within 5 yr. of retirement), subjects were selected for this study. The two groups were matched for duration of employment and work area, e.g., smelter versus engineering section. All subjects had been considered healthy at the time of retirement; none had been granted disability pensions. Information was obtained from the records of the local union office. The final criterion for selection was the contemporary address of the wife (or widow) within the Sudbury area.

A questionnaire was developed to evaluate the activities of the 46 men during the period 5 yr. before and 5 yr. after (or until death) retirement. Nominal answer questions included owning a camp, driving a car, having a part-time job, or the pursuit of a hobby, either before or after retirement. The other questions referred to activity measures (decrease, no change, increase) with respect to hobby time, visiting friends, organized sports, driving a car, travel periods, and watching television. There were also questions about the type of hobby or sport and organized activity, e.g., gardening versus more sedentary diversions. As an indicator of the wife's accuracy, the questionnaire

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contained references to the pensioner's reason for retirement (normal, early, or health), number of sick days per year, major working shift, and type of job.

The questionnaire was administered verbally by interviewing the wives personally or by telephone; equal numbers of wives from each group (living versus deceased husbands) were evaluated by the two methods. Comparisons of the wives' answers about their husbands' working conditions, shift history and health were totally commensurate with the records kept by the union. The diagnosed causes of death were dominated by heart failure or cancer (accident victims had been included in the study), although about 60% of the cases involved other explanations.

A discriminant analysis (DISCRIMINANT) using SPSS software on a DEC 2020 System computer determined which variables differentiated the survivors from the non-survivors. The 20 men who died within 5 yr. of retirement demonstrated decreased frequencies (standardized coefficients in parenthesis) of visiting friends (-0.83), hobbying (-0.40), and traveling (-0.47) after retirement relative to the survivors. Non-survivors also quit their preretirement part-time jobs after retirement (-0.36) and showed increased changes in sleeping habits (0.41). They also had riskier jobs (0.33) as defined by mortality statistics and less post-retirement income (-0.42).

The function containing these seven variables correctly classified 98% of the cases ($p < 10^{-4}$) and displayed a canonical correlation of 0.89 (Wilkes' Lambda = 0.20) and an eigenvalue of 3.96. Single variables demonstrated the vigor of the effect. The numbers of surviving or deceased pensioners who showed an increase, no change, or decrease in post-retirement activity with friends was 23, 3, 0, and 2, 11, and 7, respectively ($\chi^2 = 28.90$, $df = 2$, $p = .001$); for post-retirement change in hobby the values for survivors and deceased subjects were 20, 6, 0, and 2, 13, and 5, respectively ($\chi^2 = 21.89$, $df = 2$, $p < .01$).

Conceptually, we expected a "dose-dependence" relationship between the relative amount of post-retirement changes in activity and the latency of death. Analyses for the cases of deaths as a function of years (1 to 5) and activity measures indicated statistically significant negative correlations between change in organized activities, such as bowling ($r = -0.41$) and hobby activity ($r = -0.55$). In other words, those pensioners who decreased activity after retirement died sooner than those who showed no change or increased activity. Similarly, those who traveled more during the retirement years died later than those who travelled less ($r = 0.50$, $p < .01$).

Survivors also significantly ($p < .05$) increased use of the car ($\chi^2 = 15.61$) and organized activity ($\chi^2 = 14.83$); these variables were correlated with components of the discriminant function. Interestingly, the survivors had more health problems after retirement than the non-survivors ($\chi^2 = 4.31$, $p = .03$). Survivors and non-survivors did not differ on measures of camping activity, watching TV, type of hobby, sick days before retirement shift, years of work ($M = 32$ yr.) in the industry or the "toughness" of the job done. None of the preretirement measures were statistically significant.

This study reaffirms previous reports that the severity of the change following sudden shifts in schedule contributes to likelihood of death. Our results indicate that those males who increased their activity after retirement were clearly discriminated from those who died. This suggests that the deadly consequences of a sudden change in activity due to retirement might be attenuated by a compensatory increase in other activities. However, it must be remembered that these measures were based upon the memories of the pensioners' wives. It is possible that widows remember different components of their husbands' predeath behavior than wives with surviving spouses.

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